REMARKS

The present Amendment amends claims 1-3, 7-10, 12, 14-16, 18-23 and 24 and leaves claims 4, 6, 11, 13 and 23 unchanged. Therefore, the present application has pending claims 1-4 and 6-24.

Claims 1-4, 6-14, 18-20 and 24 stand provisionally rejected under the judicially created doctrine of obviousness type double patenting as being unpatentable over claims 1-8 of copending application Serial No. 11/331,083. Applicants do not agree with this rejection. However, in order to expedite prosecution of the present application filed on even date herewith is a Terminal Disclaimer obviating this rejection. Therefore, this rejection is overcome and should be withdrawn.

It should be noted that the filing of the Terminal Disclaimer was not intended nor should it be considered as an agreement on Applicants part that the features recited in claims 1-4, 6-14, 18-20 and 24 are taught or suggested by claims 1-8 of the copending application. The filing of the Terminal Disclaimer was simply intended to expedite prosecution of the present application.

Claims 1, 2, 6, 7, 10-12, 18, 19 and 24 stand rejected under 35 USC §102(e) as being anticipated by Chen (U.S. Patent No. 6,675,264); and claims 8, 9, 13, 14 and 20 stand rejected under 35 USC §103(a) as being unpatentable over Chen in view of Bachmat (U.S. Patent No. 6,275,897). These rejections are traversed for the following reasons. Applicants submit that the features of the present invention as now more clearly recited in the claims are not taught or suggested by Chen or Bachmat whether taken individually or in combination with each other as suggested by the Examiner.

Therefore, Applicants respectfully request the Examiner to reconsider and withdraw these rejections.

Amendments were made to the claims to more clearly describe features of the present invention. Particularly, amendments were made to the claims to more clearly recite that the present invention is directed to a disk array device and method for controlling a disk device.

According to the present invention, the disk array device includes a plurality of input/output channels each of which receives a data input/output request from at least one external device, a plurality of cache memories provided for the corresponding respective input/output channels, each of the cache memories connected to each of the corresponding respective input/output channels, a disk drive device, a disk control module that performs data input/output to and from the disk drive device, at least one communication module that communicatively connects the input/output channels with the disk control module and a control module that controls, upon receiving a data input/output request from the at least one external device, a sequence of execution of a first operation of a response processing to respond to the at least one external device according to the data input/output request and a second operation of a consistency maintaining processing to maintain consistency of data stored in each of the cache memories such that one of the first and second operations is executed first and the other of the first and second operations is executed second.

Particularly, according to the present invention an analysis of the data input/output request is performed to determine whether maintaining consistency of data stored in each cache memory is necessary and the

sequence of execution is controlled so that the first operation is executed first if maintaining consistency is not necessary.

The above described features of the present invention allows for situations, when updates for data stored in each cache memory corresponding to an input/output channel takes place, where processing to maintain consistency for the data is not necessary before responding to a data input/output request. The Examiner's attention is directed to the discussion of the features of the present invention as set forth on page 5, lines 8-17 and in the paragraph bridging pages 6 and 7 of the present application.

According to the present invention such situations where maintaining consistency is not necessary before responding to a data input/output request can, for example, occur where the data input/output request requests access to data stored in a certain storage region through a specific input/output channel or where certain types of software are operating on the host computer. These features of the present invention reduces the overhead required for performing a processing to maintain consistency when such consistency is not required for the particular data input/output request. Thus, according to the present invention the execution order of a first operation of a processing to respond to the host computer with respect to the data input/output request and a second operation of a processing to maintain consistency can be set according to the contents of the input/output request.

The above described features of the present invention now more clearly recited in the claims are not taught or suggested by any of the references of record whether taken individually or in combination with each other.

It should be noted that apparently the Examiner agrees that such features are not taught or suggested by any of the references of record being that the Examiner specifically states in the Office Action that the primary reason for allowance of, for example, claims 3 and 4 is the limitation "wherein the consistency maintaining module performs the consistency maintaining processing depending on the content of the data input/output request".

It should be further noted that the above described features stated by the Examiner as rendering the claims patentable are now reflected in the amendments made to the claims rejected based on Chen and Bachmat. Thus, the present invention including the features now recited in the claims is not taught or suggested by either Chen or Bachmat whether taken individually or in combination with each other as suggested by the Examiner.

Both Chen and Bachmat teaches an updating process of cache memory and a process relating to the writing of data.

However, at no point is there any teaching or suggestion in either Chen or Bachmat of the features of the present invention as now recited in the claims wherein a control module controls a sequence of execution of a first operation responding to the input/output request and a second operation of maintaining consistency of data stored in cache memories such that one of the first and second operations is executed first and the other of the first and second operations is executed second as in the present invention.

Further, there is no teaching or suggestion in either of Chen or Bachmat that an analysis of the data input/output request is performed so as to determine whether maintaining consistency of data stored in each cache memory is necessary such that the sequence of execution is controlled so

that the first operation is executed first if maintaining consistency is not necessary.

Thus, both and Chen and Bachmat fail to teach or suggest a control module that controls, upon receiving a data input/output request from the at least one external device, a sequence of execution of a first operation of a response processing to response to the at least one external device according to the data input/output request and a second operation of a consistency maintaining processing to maintain consistency of data stored in each of the cache memory such that one of the first and second operations is executed first and the other of said first and second operations is executed second as recited in the claims.

Further, both Chen and Bachmat fail to teach or suggest that an analysis of the data input/output request is performed to determine whether maintaining consistency of data stored in each cache memory is necessary and the sequence of execution is controlled so that the first operation is executed first if maintaining consistency is not necessary as recited in the claims.

Therefore, as is clear from the above, both Chen and Bachmat fail to teach or suggest the features of the present invention as now more clearly recited in the claims and as such the combination of Chen and Bachmat also fails to teach or suggest the features of the present invention as now more clearly recited in the claims. Accordingly, reconsideration and withdrawal of the 35 USC §102(e) rejection of claims 1, 2, 6, 7, 10-12, 18, 19 and 24 as being anticipated by Chen and the 35 USC §103(a) rejection of claims 8, 9,

13, 14 and 20 as being unpatentable over Chen in view of Bachmat is respectfully requested.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to the references utilized in the rejection of claims 1, 2, 6-9, 10-14, 18-20 and 24.

Applicants acknowledge the Examiner's indication in the Office Action that claims 3, 4, 15, 16 and 21-23 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. Amendments were made to claims 3, 4, 15, 16 and 21-23 to place them in independent form including all the limitations of the base claim and any intervening claims. Therefore, claims 3, 4, 15, 16 and 21-23 are allowable as indicated by the Examiner.

In view of the foregoing amendments and remarks, applicants submit that claims 1-4 and 6-24 are in condition for allowance. Accordingly, early allowance of claims 1-4 and 6-24 is respectfully requested.

To the extent necessary, the applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C., Deposit Account No. 50-1417 (IIP-5046).

Respectfully submitted,

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